AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) An information recognition device, comprising:

a thermal radiation detection ~~means~~ unit for:

~~detecting, by a thermal radiation sensor,~~ sensing thermal radiation emitted from ~~an object to be detected~~ a sensed object; and

~~having plural different pieces of attribute information existing in a detection range~~ generating an output waveform based on the sensed thermal radiation;

a signal processor for:

dividing the output waveform into a plurality of time-series frames; and

calculating feature data by frequency processing the time-series frames in accordance with a predetermined modeling method;

a behavior pattern model storage ~~means~~ unit for storing a behavior pattern model ~~obtained by modeling output of the thermal radiation sensor depending on a behavior pattern of an object to be detected by using a predetermined modeling method~~ of a target object; and

an information recognition ~~means~~ unit for:

comparing the feature data with the stored behavior pattern model;

calculating, based on the comparison result, a likelihood that the sensed object constitutes a target object; and

recognizing, based on the calculated likelihood, the sensed object to be a target object. ~~plural different pieces of attribute information relating to the object-to-be-detected existing in the detection range based on a detection result of the thermal radiation detection means and the behavior pattern model stored in the behavior pattern model storage means, wherein the information recognition means extracts the feature data from the detection result of the thermal radiation detection means, calculates the likelihood between the feature data and the behavior pattern model based on the feature data and the behavior pattern model stored in the behavior pattern model storage means, and recognizes plural different pieces of attribute information relating to the object-to-be-detected based on the calculated likelihood.~~

2. (Currently Amended) The information recognition device according to claim 1, wherein the behavior pattern model storage ~~means~~ unit stores plural behavior pattern models depending on respective types of behavior patterns.

3. (Canceled)

4. (Currently Amended) The information recognition device according to ~~any one of claims 1 to 3~~ claim 1 or claim 20, wherein the thermal radiation sensor is a thermo-sensor.

5. (Currently Amended) The information recognition device according to ~~any one of~~

~~claims 1 to 3~~ claim 1 or claim 20, wherein the thermal radiation sensor is a quantum sensor.

6. (Currently Amended) The information recognition device according to ~~any one of claims 1 to 3~~ claim 1 or claim 20, wherein the thermo-sensor is a pyroelectric infrared sensor for detecting infrared emitted from the object-to-be-detected using a pyroelectric effect.

7. (Currently Amended) The information recognition device according to ~~any one of claims 1 to 3~~ claim 1 or claim 20, wherein the predetermined modeling method is an HMM (hidden Markov model).

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Currently Amended) The information recognition device according to ~~any one of claims 1 to 3~~ claim 1 or claim 20, wherein the feature data comprises first feature data constituted by a spectrum in a frame unit of ~~a detection result~~ the output waveform of the thermal radiation detection ~~means~~ unit and second feature data constituted by an average amplitude value of the spectrum in the frame unit.

12. (Original) The information recognition device according to claim 11, wherein the first feature data is obtained by transforming a value of the spectrum in the frame unit into a value of a common logarithm.

13. (Previously Presented) The information recognition device according to claim 12, wherein the feature data further comprises third feature data constituted by a difference between feature indicated by the first feature data of a selected frame and feature indicated by the first feature data of the frame immediately before the selected frame.

14. (Original) The information recognition device according to claim 13, wherein the feature data further comprises fourth feature data constituted by a difference between feature indicated by the second feature data of a selected frame and feature indicated by the second feature data of the frame immediately before the selected frame.

15. (Currently Amended) The information recognition device according to ~~any one of claims 1 to 3,~~ claim 1 or claim 20, wherein when the behavior pattern model is constituted by the feature data of a high dimension of four or more, the device comprises:

a feature data display ~~means~~ unit for displaying the feature data corresponding to each behavior pattern model stored in the

behavior pattern model storage ~~means~~ unit as a coordinate point in a two- or three-dimensional space; and

a detection result display ~~means~~ unit for displaying a coordinate point corresponding to a detection result of the thermal radiation detection ~~means~~ unit in a space in which the coordinate point of the feature data is displayed.

16. (Currently Amended) An information recognition method, comprising:

~~detecting, by a thermal radiation sensor,~~ sensing thermal radiation emitted from ~~an object to be detected~~ a sensed object ~~having plural different pieces of attribute information and existing in a detection range~~;

generating an output waveform based on the sensed thermal radiation;

dividing the output waveform into a plurality of time-series frames;

calculating feature data by frequency processing the time-series frames in accordance with a predetermined modeling method;

~~preparing~~ storing a behavior pattern model ~~obtained by modeling output of the thermal radiation sensor depending on plural types of behavior patterns of plural objects to be detected by using a predetermined modeling method~~ of a target object; ~~and~~

comparing the feature data with the stored behavior pattern model;

calculating, based on the comparison result, a likelihood that the sensed object constitutes a target object; and

recognizing, based on the calculated likelihood, the sensed object to be a target object. ~~plural different pieces of attribute information relating to the object-to-be-detected existing in the detection range based on a detection result of the thermal radiation sensor and the behavior pattern model, wherein in recognizing plural different pieces of attribute information, feature data is extracted from the detection result of the thermal radiation sensor, the likelihood between the feature data and the behavior pattern model is calculated based on the feature data and the behavior pattern model, and plural different pieces of attribute information relating to the object-to-be-detected is recognized based on the calculated likelihood.~~

17. (Currently Amended) A non-transitory computer-readable storage medium tangibly embodied in a storage device storing instructions which, when executed by a processor, perform an ~~An~~ information recognition method ~~program executed by a computer,~~ comprising:

~~a thermal radiation detecting step of detecting,~~ sensing by a thermal radiation sensor[[,]] thermal radiation emitted from ~~an object-to-be-detected~~ a sensed object, and generating an output waveform based on the sensed thermal radiation ~~having plural different pieces of attribute information and existing in a detection range~~;

dividing the output waveform into a plurality of time-series frames, and calculating feature data by frequency processing the time-series frames in accordance with a predetermined modeling method;

~~a behavior pattern model storing step of storing~~ recalling a stored behavior pattern model ~~obtained by modeling output of the thermal radiation~~

~~sensor depending on plural types of behavior patterns of plural objects to be detected by using a predetermined modeling method~~ of a target object; ~~and~~

~~an information recognizing step of~~ comparing the feature data with the stored behavior pattern model;

calculating, based on the comparison result, a likelihood that the sensed object constitutes a target object; and

recognizing, based on the calculated likelihood, the sensed object to be a target object. ~~plural different pieces of attribute information relating to the object to be detected existing in the detection range based on a detection result in the thermal radiation detecting step and the behavior pattern model stored in the behavior pattern model storing step, wherein~~

~~in the information recognizing step, feature data is extracted from the detection result in the thermal radiation detecting step, the likelihood between the feature data and the behavior pattern model is calculated based on the feature data and the behavior pattern model stored in the behavior pattern model storing step, and plural different pieces of attribute information relating to the object to be detected is recognized based on the calculated likelihood.~~

18. (Currently Amended) An alarm system, comprising:

the information recognition device according to ~~any one of claims 1 to 3~~ claim 1 or claim 20;

a determination ~~means~~ unit for determining whether or not the ~~object-to-be-detected~~ sensed object is a person based on a recognition result of the information recognition ~~device~~ unit; and

an alarm ~~means~~ unit for raising an alarm when the determination ~~means~~ unit determines that the ~~object-to-be-detected~~ sensed object is a person.

19. (Currently Amended) An alarm system, comprising:

the information recognition device according to claim 15,

a determination ~~means~~ unit for determining whether or not the ~~object-to-be-detected~~ sensed object is a person based on a recognition result of the information recognition ~~device~~ unit; and

an alarm ~~means~~ unit for raising an alarm when the determination ~~means~~ unit determines that the ~~object-to-be-detected~~ sensed object is a person.

20. (New) An information recognition device, comprising:

a thermal radiation detection unit for detecting, by a thermal radiation sensor, thermal radiation emitted from a sensed object having attribute information and existing in a detection range;

a signal processor for dividing an output waveform acquired from the thermal radiation detection unit into a plurality of time-series frames, and calculating feature data from a result of frequency professing of each of the plurality of time-series frames;

a behavior pattern model storage unit for storing a behavior pattern model obtained by modeling, in accordance with a predetermined

modeling method, a behavior pattern of the sensed object, by using feature data calculated from a result of frequency professing of each of the plurality of time-series frames into which an output waveform from another thermal radiation detection unit is divided; and

an information recognition unit for calculating a likelihood that the sensed object represented by the feature data calculated by the signal processor constitutes an object represented by the behavior pattern model stored in the behavior pattern model storage unit, and recognizing, based on the calculated likelihood, the sensed object to be the object represented by the behavior pattern model stored in the behavior pattern model storage unit.

21. (New) The information recognition device according to claim 1 or claim 20, wherein the signal processor divides a single output waveform acquired from the thermal radiation detection unit into the plurality of time-series frames.

22. (New) The information recognition device according to claim 1 or claim 20, wherein the signal processor divides at least one single output waveform acquired from the thermal radiation detection unit into the plurality of time-series frames.

23. (New) The information recognition device according to claim 1 or claim 20, wherein the feature data is calculated from a spectrum of the output waveform of each of the plurality of time-series frames.